A New Approach for Allocating a New Party's Budget during an Election Campaign

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Abstract

During pre-election campaigns, parties make great efforts to persuade constituents to vote for them. Usually, new parties have smaller budgets and fewer resources than veteran parties. Generally, the more heterogeneous the party's electorate, the more critical the issue of resource allocation. This paper presents a method for new parties to efficiently allocate campaign advertising resources and maximise voters. The model developed uses the Pareto principle and multi-criteria approach, integrating the party's confidential data together with official open-to-all data. We implemented the model on a specific new party during the intensive political period before the April 2019 elections in Israel, finding that the model produced clear and unbiased results, and this made it effective and user-friendly for strategy teams and campaign managers.

Keywords: election campaign; Multi-Criteria Decision Making; in-depth surveys; voting patterns; Pareto approach

Introduction

The pre-elections political campaign of a new party can be compared to the marketing campaign for a new commercial product (Lilien et al., 1992; O'Cass, 1996; Henneberg, 2008). In both campaigns, huge efforts are made to persuade voters (consumers) to choose the new party (product) over better-known ones (Gordon et al., 2012). However, there are some important differences between these campaigns. The first involves the degree of freedom available. Private companies are free to decide when to launch their commercial campaign and when to end it, whereas political parties must conduct their campaigns during a time frame that is dictated by law. Another important difference is related to the timing of the marketing campaign; unlike standard marketing campaigns, the election campaign of a new party is conducted simultaneously with those of all other parties.

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In this article, we present an approach for supporting a new party's strategic decisions in budget allocation. Our approach is novel in two regards. First, it utilises a multi-criteria decision making (MCDM) methodology and various techniques to weight criteria in the context of political campaigns. Second, our model is tested using a combination of a party's confidential dataset and information from public databases. The advantages of our model are its transparency and simplicity, which make it a useful tool for campaign managers and party leaders. As a case study, we implemented the model during the April 2019 election in Israel.

Voting behaviour

The theoretical literature on voting behaviour has shown that a rational voter may sometimes decide to vote for a candidate or party that is not his or her first preference (e.g., Cox & Shugart, 1996; Farquharson, 1969; Felsenthal & Brichta, 1985). Such voters are traditionally called "strategic voters", in contrast to voters who always vote for their first preference regardless of how others are likely to vote. Farquharson (1969) was the first to propose a model attempting to trace the calculations of strategic voters. His successors examined strategic voting by focusing on entry barriers in multi-member districts (Cox & Shugart, 1996). They showed that voters desert both weak parties and parties that seemed guaranteed to win because they are concerned about wasting their votes.

One must distinguish between the allocation of resources before elections and the allocation of resources afterwards. The former is aimed at persuading voters to change their preferences, while the latter seeks to retain current voters and increase their numbers (Lazarus & Reiley, 2010; Levitt et al., 1997; Squire, 1995). For example, studies found that constituents increase their support for incumbents when more resources are allocated to their district. To gain this support, incumbents must continuously convince constituents that expenditures in their district are a direct result of the actions of the party or the incumbents.

Studies have discussed this issue extensively, mainly in electoral systems such as the "winner takes all" approach used in the United States. Researchers have also investigated this issue from the point of view of voters, assuming that individual voting preferences are affected by the exposure achieved by candidates and the tone of the coverage (Bartels, 1988; Cohen et al., 2004; Gordon et al., 2012; Shachar, 2009).

Campaign finance and management

Although large and veteran parties face many challenges (Poguntke et al., 2016), they still have advantages over new parties. A large, veteran party has a steady core of loyal voters who always vote for it, can present proof of tangible results to actual and potential constituents, and has a steady federal budget to support its activities. None of these advantages exists for smaller or newer parties. Smaller and newer parties must overcome additional obstacles, such as making themselves known to voters, attracting their attention, and exciting voters in a way that will draw their support. Overcoming these obstacles is very ambitious, but essential for new parties to gain parliamentary seats.

Given these factors, new parties' advertising during their campaign should be as precise and targeted as possible. Achieving this precision is not a simple task, given the abundance of advertising alternatives and their various target audiences.

These are very ambitious goals. To achieve them, the campaign must be very convincing. It must appeal to voters' logic, and to a certain extent their feelings. Given new parties' limited resources, the importance of a campaign focused on voters among whom these goals can be achieved cannot be overemphasised. The model presented in this paper offers a way to translate a theoretical cost–benefit analysis into a practical roadmap for a new political party by prioritising clusters of potential voters using characteristics identified from in-depth interviews.

Obviously, a portion of any campaign's budget should be devoted to data collection. In-depth interviews are useful for achieving this goal. This popular type of qualitative research can collect detailed questionnaires and data from focus groups. Empirical data analysis can then provide the basis for planning the best possible campaign. Ideally, interviews should indicate the party's strengths and weaknesses; help planners understand which issues and ideas the party should emphasise, play down or change; and identify the characteristics of potential voters. Such insights are valuable for all parties, but they are indispensable for smaller, newer parties that lack a voting history and practical experience (on one hand) and must surmount significant budgetary limitations (on the other). Previous studies in political marketing used a combination of in-depth interviews and

historical data regarding parties' vote share and census statistics (to monitor the demographic structure of a constituency) to develop a planning model for political marketing (Baines et al., 2002; Shea, 1996). Yet, the issue of allocating campaign resources is rarely investigated in the academic literature. Snyder (1989) analyses the case of two parties' competition for legislative seats across districts, when the goal of each party is to maximize the expected number of seats or when the goal is to maximize the probability of winning a majority of the seats.

While a new party's decision to launch a campaign may resemble efforts to market a new product, there are some important differences. First is the degree of freedom available. Private corporations are free to decide when to launch their commercial campaign and when to end it, whereas political parties must conduct their political campaigns during a set time frame that is dictated by external circumstances and considerations. Moreover, early elections often occur in Israel, creating a great deal of uncertainty and difficulties in campaign organisations, particularly for new parties. Another important difference is related to the timing of the marketing campaign. Unlike standard marketing campaigns, new parties' election campaigns are conducted simultaneously with those of their competitors. Furthermore, given that voters' (customers') decision is a one-time event that cannot be changed or cancelled, at least until the next election, there is no room for mistakes.

Given these factors, the advertising utilised by a new party should be as precise and targeted as possible during the campaign. Achieving this precision is not a

simple task, given the abundance of advertising alternatives and their various target audiences.

Israel's political system

Israel has a unicameral parliament (the Knesset) whose members are elected by a closed-list system of proportional representation, with the entire country serving as one constituency. Its political system has been described as a hybrid, combining electoral rules, a fragmented party system, and bipolar competition (Rahat & Hazan, 2005; Shugart, 2011).

In the run-up to the elections, parties launch campaigns to persuade voters to support them. Such campaigns are very expensive. To compensate for the fact that some parties have more money than others, the state participates in the financing of campaigns by allocating "funding units" to each party. Each funding unit equals a certain amount of money set by law. The units are distributed among the parties as follows: parties that have gained enough votes to have seats in the Knesset receive a number of units equal to the number of mandates obtained; parties that have not won any seats in the Knesset, but have garnered at least 1% of the votes, receive one funding unit; and parties that have not passed the 1% threshold do not receive any funding units.[4] This method rewards large, veteran parties with proven track records that can afford to run expensive campaigns. In contrast, smaller and newer parties that are not currently serving in the Knesset and/or are embarking on their first political campaign have much tighter budgetary constraints.

All of the 34 OECD countries, except Switzerland, have funding units by law. Hence, the concept that parties should have special budgets for their campaigns during the election is common and well established in democracies. However, compared to the other OECD countries, the parties in Israel receive much more money because of strong restrictions regarding donations to political parties.

The case of Israel, with its proportional representation system, was analysed by several scholars who found that neither political preference nor coalition expectations differ systematically between those who support their most preferred party and those who support other parties (Felsental & Brichta, 1985). Three recent studies convincingly demonstrated how coalition preferences affect the voters' choices beyond party or leader preferences. Blais et al. (2006) showed that, in the 2003 Israeli elections, coalition preferences led one in ten voters to support a party other than the one they preferred most. Similarly, Abramson et al. (2006) demonstrated that, in the 2006 Israeli elections, voters acted strategically to help create the coalition they desired. Bargsted and Kedar (2009) identified the ideological dimension of strategic coalition voting more precisely. They found that leftist voters deserted the Labor Party when the party was unlikely to participate in a government coalition and instead opted for a centrist party, the "lesser of two evils".

Methodology

To determine an effective allocation for a new party's financial resources, we

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[4] *https://www.idi.org.il/articles/25939*

utilised a multi-criteria decision making (MCDM) approach. This approach applies a structured process to select the best alternative out of a finite set of alternatives, in accordance with a set of pre-defined criteria. Assuming that decision-makers have the ability to express their opinions on each alternative and regarding each decision criteria, the difficulty derives from the fact that the evaluation and ranking of all alternatives should be done in accordance with all criteria simultaneously.

The MCDM approach and its ranking methods have been the focus of a great deal of attention in the academic literature. Comprehensive and detailed reviews appear in Triantaphyllou (2000); Ishizaka and Nemery (2013); and Zopounidis and Doumpos (2017). This approach is widely used in real-life issues regarding such diverse subjects as economics (Doumpos & Zopounidis, 2014; Wan et al., 2018) and engineering (Liu et al., 2019; Wan et al., 2018). However, it is rarely used in the context of elections or political campaign. A unique example of implementing MCDM to analyse the problem of selecting candidates in e-voting is found in Alguliyev et al. (2019).

The goal of our model is to determine the localities in which a new political party would be best advised to utilise its budget for maximum effect. To the best of our knowledge, the current study is the first to demonstrate the power of MCDM in the context of resource management during election campaigns. Furthermore, the simplicity and clarity of our approach allow campaign managers to easily follow its rationale and use it to make strategic decisions. In the next sections, we will describe the implementation of our approach within a specific case study, step by step.

Case study

Forty parties competed in Israel's 2019 election; 29 of them were new. One such party was "Zehut" (hereafter denoted by the letter "Z"). Although "Z" was unknown at the beginning of the campaign and had few resources, its strategic team was determined to maximise the party's achievements in the election. One issue debated by the team was the allocation of funding among various advertising alternatives (i.e., digital and physical media, press, social networks, etc.). A sub-issue in this context was how to prioritise the allocation of the resources for physical media such as outdoor signage, flyers, and billboards among the different localities. The strategy team asked the author for advice regarding this issue. On this mission, the author concentrated on focusing and ranking, following a five-stage process—shown in Figure 1 and explained hereafter.
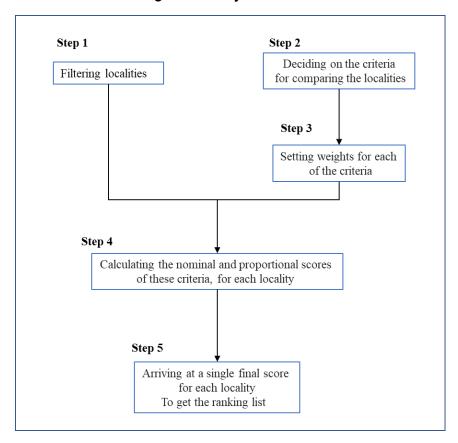
Figure 1. Analysis Process

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│                                                                   │
│  Step 1                      Step 2                               │
│  ┌─────────────────┐         ┌──────────────────────────┐         │
│  │ Filtering        │        │ Deciding on the criteria │         │
│  │ localities       │        │ for comparing the        │         │
│  └─────────────────┘         │ localities               │         │
│                              └──────────────────────────┘         │
│                                                                   │
│                              Step 3                               │
│                              ┌──────────────────────────┐         │
│                              │ Setting weights for each │         │
│                              │ of the criteria          │         │
│                              └──────────────────────────┘         │
│                                                                   │
│  Step 4                                                           │
│  ┌────────────────────────────────────────────────────┐          │
│  │ Calculating the nominal and proportional scores      │         │
│  │ of these criteria, for each locality                 │         │
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│  Step 5                                                           │
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│  │ Arriving at a single final score            │                  │
│  │ for each locality                           │                  │
│  │ To get the ranking list                     │                  │
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1.   Step 1: Filtering localities

According to official data, there were 1,195 localities in Israel in 2019. Dealing with so many localities was impractical, so we conducted a preliminary, two-stage process to select the main localities on which to focus. First, we identified 145 localities whose electoral profile was homogeneous and very different from the platform of "Z", then removed them from the list. In the second stage, we applied the Pareto principle. The 1,050 remaining localities were sorted in descending order based on the number of voters, until the threshold of 80% of relevant voters was reached. At the end of this second stage, 70 localities remained on the sub-list, consisting of 3.0 million voters (out of about 3.6 million total voters in the 1,050 localities). Each locality on this sub-list had had more than 10,000 voters in the previous elections (two localities had more than 200,000 voters, 14 localities had 50,000 to 200,000 voters, and 56 localities had 10,000 to 50,000 voters).

2.   Step 2: Deciding on the criteria

To decide on the criteria, in-depth interviews and focus group discussions were conducted with people who represented the overall political map to discuss the relevant issues. Experts analysed the results and transcripts of these questionnaires, and extracted the criteria from them.

The number of criteria determined in this way depended on the number of characteristics identified through in-depth interviews. We could use the statistical significance of the results to determine their importance. Obviously, it is possible to

add criteria that were not derived from the in-depth interviews, but rather based on experience or rational judgment.

To determine the criteria in our case, we used data that were collected and analysed by a respected research firm hired by "Z". The research firm conducted in-depth interviews with a representative sample of 1,007 people who answered detailed questionnaires, and led six focus groups consisting of 10–15 people each. The firm's experts, together with members of the party's strategy team, analysed the results of the questionnaires and the transcriptions to extract the criteria from them.

The results of the analysis showed that potential voters for "Z" were young, educated, and earned an average salary. In addition, the analysis found that there was a substantial potential electorate among immigrants from the former Soviet Union who came to Israel during the 1990s. Other characteristics, such as previous political orientation or intensity of religious belief, were not found to be meaningful in this context.

3. Step 3: Weighting the criteria

The issue of weighting criteria has been widely discussed in the literature, mainly because this process is strictly dependent on the subjective assessments of decision-makers (Krylovas et al., 2014; Petrovsky, 2001; Saaty, 1977, 1980, 1990; Utkin, 2014). To avoid potential drawbacks, we set weights in two stages. First, we ranked the criteria qualitatively based on the statistical significance levels obtained in the preliminary analysis: the more significant the criterion, the higher it was ranked. Second, we chose the three simple

and easy-to-implement weighting techniques that were presented in Barron and Barrett (1996):

a. Equal weights (EW). This is the simplest technique. It is used when the criteria cannot be rated or prioritised, either because of lack of information or because the information indicates that all of the criteria have the same significance. In this case, given N criteria, the weight of each criterion will be 1/N. For example, in the case of four criteria, the weight of each criterion will be 25%.

b. Rank-sum (RS). In this technique, weights are linearly proportional to their significance rank, and their sum is normalised to 1. For simplicity, assume that the criteria are arranged in an order that is identical to their importance (i.e., criterion 1 is ranked higher than criterion 2 and so on until the last, least important criterion indexed/N). In such a case, the formula for the weight of the jth criterion is:

$$w_j = \frac{2(N - j + 1)}{N(N + 1)} \qquad (1)$$

In the case of four criteria, their weights would be: 40%, 30%, 20%, and 10%.

c. Rank-order centroid (ROS). In this technique, weights are computed from the vertices of a simplex and their sum is normalised to 1. As before, the order of the criteria is equal to their importance. The formula for the weight of the jth criterion is:

$$w_j = \frac{1}{N} \sum_{k=j}^{N} \frac{1}{k} \qquad (2)$$

In the case of four criteria, their weights would be: 52%, 27%, 14%, and 6%.

Table 1 lists the four criteria, in descending order of importance, along with their weights using these three techniques.

Table 1: Criteria, criteria definitions, and weights in each technique

#	Criterion	Definition	EW	RS	ROC
1	**Age group**	Rate of people ages 20−34 in locality	0.25	0.4	0.52
2	**Country of origin**	Rate of people in the locality who are immigrants from the former Soviet Union	0.25	0.3	0.27
3	**Educational level**	Rate of highly educated people in locality	0.25	0.2	0.15
4	**Income**	Gap, in absolute value, from average income in locality	0.25	0.1	0.06

4. Step 4: Calculating the nominal and proportional scores

Next, we calculated the nominal scores of the localities based on each criterion. In many cases, the MCDM score matrix was created based on expert evaluations or brainstorming (e.g., pairwise comparison). The complexity of this process, the difficulty of maintaining internal traceability, and the subjectivity inherent are key arguments made by critics against the MCDM method and the AHP process (Asadabadi et al., 2019; Noghin, 2001). However, as we noted in the previous section, these shortcomings are avoided in our case, because the score matrix was objectively calculated using independent external resources. First, we extracted the demographic and socioeconomic data of localities throughout Israel and the information on voting patterns from official Israeli websites (Central Bureau of Statistics, 2018; Results of the 20th Knesset, 2015). We also used other popular public databases (Hovav, 2017; Results of the 2015 Elections, 2019). Second, we normalised these nominal scores by using the revised analytic hierarchy process (Belton and Gear, 1983). A proportional score of the ith-criterion in the jth-locality is the quotient of the nominal score divided by the maximum score calculated in this criterion, namely:

$$y_{ij} = \frac{x_{ij}}{\max_{j}\{x_{ij}\}} \quad i = 1,2,\dots N \qquad (3)$$

where N is the number of criteria, x_{ij} is the nominal score of the ith-criterion in the jth-locality, and y_{ij} is the relative score of the ith-criterion in the jth-locality.

For example, to calculate a locality's score regarding the "age group" criterion, we first obtained the percentage of residents aged 20−34 in each of the 70 localities; the maximum value in this criterion was 28.7 (in the city of Tel Aviv-Jaffa). We then used this value to calculate the proportional scores of all 70 localities according to Equation 3, to get their

proportional scores. Thus, the nominal score of Acre (24.9) was normalised to 0.87 (=24.9/28.7), the nominal score of Afula (22.3) was normalised to 0.78, and so on. We repeated the same process for all criteria, to get normalised scores. The list of nominal and normalised scores of the 70 localities is found in Table A.1 in the appendix.

5. *Step 5: Arriving at a single score for each locality and ranking localities*

The last step was to calculate the final scores of the localities. Various models are available for aggregating the multi-criteria weights and scores of alternatives into a single score. In our study, we used the classic and popular weighted sum (WS) model. According to this model, the final grade of an alternative is obtained by multiplying the grades for each criterion by the weight of the criteria, namely:

$$Final\_Score(j) = \sum_{i=1}^{N} w_i y_{ij} \; \forall j \qquad (4)$$

Table 2 lists the top 10 localities using each weighting method.

Table 2: Ranking obtained through each weighting method

Rank	EW		RS		ROC	
	Name of locality	Score	Name of locality	Score	Name of locality	Score
1	Ariel	82.8%	Ariel	86.7%	Ariel	90.0%
2	Haifa	80.5%	Haifa	80.0%	Haifa	82.4%
3	Nesher	79.1%	Nazareth Illit	78.2%	Nazareth Illit	79.7%
4	Carmiel	75.0%	Nesher	76.0%	Tel Aviv Jaffa	78.8%
5	Nazareth Illit	74.9%	Tel Aviv- Jaffa	75.1%	Sderot	75.7%
6	Tel Aviv-Jaffa	74.6%	Carmiel	74.1%	Nesher	75.6%
7	Maalot-Tarshiha	70.8%	Maalot-Tarshiha	72.5%	Maalot-Tarshiha	74.5%
8	Beer Sheva	69.6%	Arad	71.3%	Carmiel	73.5%
9	Arad	69.3%	Sderot	70.6%	Arad	72.6%
10	Ashkelon	68.7%	Kiryat Yam	69.7%	Beer Sheva	70.7%

It can be seen from the table that the same eight localities were ranked in the top ten of the three methods, and that only twelve localities were ranked in all three methods. Thus, we recommended that the party's strategic team focus its efforts on these twelve localities. The full scores and rankings are listed in Table A.2 in the appendix.

Results

The elections were held on 9 April 2019. None of the new parties that competed reached the 3.25% threshold required to obtain a seat in the Knesset. "Z" received 2.74% of the votes; only one other new party received more votes (3.22%, which was also below the threshold) (Results of the 21st Knesset, 2019). There are several explanations for this failure, all of them based on the fact that voting patterns depend on many variables, some of which arise only a few days or a few hours before election day—or even during election day. Nevertheless, it should be noted that "Z" started its campaign with the support of only 0.4% of voters but ended the election with 2.74% of the votes.

Analysis of the results revealed that "Z" received more than 3.25% of the votes in 20 of the 70 localities on our sub-list, and more than 2.74% of the votes in 47 of the localities. In our focused list, the party gained much better results: 8 and 13, respectively.

Table 3. Number of localities that gave "Z" more than the required threshold of votes and more than average votes

	Sub-list	Focused list
Number of localities	70	15
Vote percentage > 3.25%	20	8
Vote percentage > 2.74%	47	13

This outcome is particularly striking when considering that, as a new party, "Z" had no core of voters or previous empirical data on which to base decisions about how to allocate its resources for maximum effect. Thus, the model provides a simple, valid tool for making data-driven decisions about allocating resources that can be easily updated for future election campaigns.

Discussion

In this article, we present a model based on multi-criteria decision making for allocating funding during elections. The novelty of the present method lies in its use of the revised analytic hierarchy process in the context of political campaigns and use of input data that combines information from a confidential dataset and public databases. Furthermore, both the weighting techniques and weighted-sum model are characterised by their simplicity and clarity. Thus, campaign managers can easily follow the model's rationale. Using only basic mathematical tools, they can tweak the model to determine how changing the preferred criteria impact the original results.

The transparency of the suggested methodology is a valuable advantage for campaign managers. Given the enormous pressure that they face during campaigns, a simple, user-friendly dynamic tool that helps them make unbiased decisions about how budget allocation may be very useful for them.

The method is particularly relevant for small and/or new parties that have no established voter base and no previous data with which to make decisions about allocating their limited resources to achieve the best results. Comparisons of various methods for weighting criteria demonstrated that the RS and ROS techniques produced results that were closest to the actual outcomes of the election. Although the model is applicable to all parties in general, it is more relevant and even urgent for new parties, due to the extra obstacles they must overcome: the absence of a steady core of loyal constituents, the lack of proven political achievements, and the non-existence of federal funding. We maintain that our model can help new parties cope with these challenges by directing their budgets efficiently and rationally.

One can argue that a model for resource allocation should address expectations about the spending behaviour of competitors or, at the very least, consider how variations among competitors affect the strengths and weaknesses of the current model. Although it is outside the scope of our research, future studies can include consideration of this factor when analysing expenditure decisions made during political campaigns, such as responses to the behaviour of competitors and advertising on traditional media versus on social networks. Furthermore, future research can make additional refinements, such as by identifying the voting patterns of neighbourhoods or mixed localities, and by building a more focused and effective map of priorities when allocating campaign budgets. In addition, given actual elections results, different weighting techniques and/or criteria combinations may be tested to improve the model's performance.

Table A.1. Nominal and relative scores for the main localities (arranged in alphabetical order)

Name of locality	Ages 20–34		Country of Origin: Former Soviet Union		Highly Educated		Income	
	Nominal Score	Relative Score	Nominal Score	Relative Score	Nominal Score	Relative Score	Nominal Score	Relative Score
Acre	24.9	0.87	17.6	0.48	13.95	0.22	6787	0.73
Afula	22.3	0.78	22.4	0.61	19.19	0.30	7446	0.80
Arad	21.1	0.74	32.3	0.88	25.14	0.39	7139	0.76
Ariel	28.4	0.99	35.4	0.96	29.65	0.46	8342	0.89
Ashdod	19.2	0.67	29.6	0.80	23.40	0.37	7997	0.86
Ashkelon	20.9	0.73	29.4	0.80	25.79	0.40	7633	0.82
Bat Yam	18.3	0.64	34.7	0.94	22.39	0.35	7016	0.75
Beer Sheva	22.0	0.77	25.8	0.70	27.20	0.43	8291	0.89
Beit Shean	22.2	0.77	5.2	0.14	11.22	0.18	6990	0.75
Beit Shemesh	20.5	0.72	17.1	0.46	25.38	0.40	6569	0.70
Carmiel	19.3	0.67	35.0	0.95	30.80	0.48	8347	0.89

Name of locality	Ages 20–34		Country of Origin: Former Soviet Union		Highly Educated		Income	
	Nominal Score	Relative Score	Nominal Score	Relative Score	Nominal Score	Relative Score	Nominal Score	Relative Score
Dimona	21.7	0.75	16.4	0.45	11.21	0.18	8252	0.88
Eilat	24.4	0.85	21.3	0.58	16.73	0.26	7634	0.82
Gan Yavne	18.1	0.63	9.0	0.24	30.34	0.48	10943	0.83
Ganei Tikva	14.9	0.52	4.9	0.13	49.04	0.77	13436	0.56
Gedera	15.4	0.54	8.8	0.24	35.27	0.55	11462	0.77
Givat Shmuel	19.0	0.66	9.4	0.26	61.10	0.96	12470	0.66
Givatayim	20.7	0.72	7.7	0.21	59.67	0.93	12207	0.69
Hadera	20.3	0.71	24.1	0.65	25.45	0.40	8297	0.89
Haifa	27.3	0.95	23.4	0.64	42.27	0.66	9603	0.97
Herzliya	18.3	0.64	11.8	0.32	47.21	0.74	11532	0.76
Hod Hasharon	16.6	0.58	6.7	0.18	53.51	0.84	13179	0.59
Holon	18.3	0.64	17.0	0.46	25.98	0.41	8806	0.94
Jerusalem	23.6	0.82	8.2	0.22	27.66	0.43	7119	0.76
Kadima-Zoran	17.3	0.60	7.3	0.20	48.70	0.76	12316	0.68

Name of locality	Ages 20–34		Country of Origin: Former Soviet Union		Highly Educated		Income	
	Nominal Score	Relative Score	Nominal Score	Relative Score	Nominal Score	Relative Score	Nominal Score	Relative Score
Kfar Saba	16.1	0.56	11.9	0.32	45.25	0.71	11751	0.74
Kfar Yona	18.0	0.63	8.6	0.23	40.98	0.64	10504	0.87
Kiryat Ata	20.6	0.72	17.4	0.47	19.87	0.31	8308	0.89
Kiryat Bialik	18.6	0.65	21.6	0.59	27.95	0.44	8843	0.95
Kiryat Gat	22.9	0.80	24.0	0.65	16.71	0.26	6670	0.71
Kiryat Malachi	25.5	0.89	15.7	0.43	10.86	0.17	6018	0.64
Kiryat Motzkin	18.3	0.64	22.4	0.61	29.01	0.45	9359	1.00
Kiryat Ono	14.8	0.51	6.9	0.19	46.62	0.73	13664	0.54
Kiryat Shmona	23.8	0.83	15.1	0.41	16.84	0.26	7221	0.77
Kiryat Tiv'on	16.1	0.56	5.3	0.14	51.91	0.81	12175	0.70
Kiryat Yam	18.8	0.65	35.3	0.96	21.97	0.34	7346	0.79
Lod	21.9	0.76	21.4	0.58	17.08	0.27	6943	0.74
Ma'ale Adumim	21.5	0.75	15.4	0.42	29.90	0.47	8936	0.96
Maalot-Tarshiha	22.6	0.79	30.9	0.84	23.88	0.37	7745	0.83

Name of locality	Ages 20–34		Country of Origin: Former Soviet Union		Highly Educated		Income	
	Nominal Score	Relative Score	Nominal Score	Relative Score	Nominal Score	Relative Score	Nominal Score	Relative Score
Mevaseret Zion	20.8	0.73	9.2	0.25	40.37	0.63	11504	0.77
Migdal Haemek	20.2	0.71	24.5	0.67	20.68	0.32	6931	0.74
Modi'in Maccabim-Reut	18.9	0.66	10.5	0.29	57.98	0.91	14217	0.48
Nahariya	18.2	0.63	20.1	0.55	28.95	0.45	9176	0.98
Nazareth Illit	22.9	0.80	36.8	1.00	27.92	0.44	7101	0.76
Nesher	21.6	0.75	28.0	0.76	42.09	0.66	9403	0.99
Ness Ziona	15.0	0.52	6.6	0.18	36.95	0.58	12814	0.63
Netanya	18.7	0.65	27.5	0.75	29.22	0.46	8275	0.89
Netivot	22.9	0.80	11.8	0.32	15.78	0.25	6314	0.68
Ofakim	24.8	0.86	20.2	0.55	11.17	0.17	6405	0.69
Or Akiva	21.2	0.74	29.8	0.81	18.37	0.29	7117	0.76
Or Yehuda	21.7	0.76	14.3	0.39	17.17	0.27	7827	0.84
Pardes Hana	17.0	0.59	12.5	0.34	34.58	0.54	10013	0.93
Petah Tikva	17.5	0.61	18.8	0.51	35.67	0.56	9910	0.94

Name of locality	Ages 20–34		Country of Origin: Former Soviet Union		Highly Educated		Income	
	Nominal Score	Relative Score	Nominal Score	Relative Score	Nominal Score	Relative Score	Nominal Score	Relative Score
Raanana	17.3	0.60	19.0	0.52	55.60	0.87	12229	0.69
Ramat Gan	21.2	0.74	11.7	0.32	45.00	0.70	10679	0.86
Ramat Hasharon	14.5	0.50	4.9	0.13	55.69	0.87	13937	0.51
Ramla	24.4	0.85	19.2	0.52	10.39	0.16	6990	0.75
Rehovot	18.6	0.65	16.1	0.44	40.04	0.63	10187	0.91
Rishon Le'zion	20.2	0.70	18.8	0.51	31.18	0.49	9976	0.93
Rosh HaAyin	22.3	0.78	5.5	0.15	32.40	0.51	10105	0.92
Sderot	26.8	0.94	25.3	0.69	16.29	0.26	6962	0.75
Shoham	19.2	0.67	4.2	0.11	63.85	1.00	14726	0.42
Tel Aviv Jaffa	28.7	1.00	14.0	0.38	48.73	0.76	10808	0.84
Tiberias	21.1	0.74	12.4	0.34	12.46	0.20	6227	0.67
Tirat Carmel	22.1	0.77	16.5	0.45	12.70	0.20	7357	0.79
Yavne	21.2	0.74	10.3	0.28	22.42	0.35	9619	0.97
Yehud	17.8	0.62	5.7	0.15	33.01	0.52	11030	0.82

Name of locality	Ages 20–34		Country of Origin: Former Soviet Union		Highly Educated		Income	
	Nominal Score	Relative Score	Nominal Score	Relative Score	Nominal Score	Relative Score	Nominal Score	Relative Score
Yokneam Illith	17.5	0.61	21.1	0.57	40.35	0.63	10779	0.85
Zefat	21.7	0.76	12.8	0.35	19.16	0.30	5862	0.63
Zichron Yaakov	16.7	0.58	10.7	0.29	53.19	0.83	13492	0.55
Maximum nominal score	28.7		36.8		63.9		9336 (average)	

Table A.2. scores, ranking and voting percentage for "Z"

Name of locality	EW		RS		ROS		Voting percentage for "z"
	Nominal score	Rank	Nominal score	Rank	Nominal score	Rank	
Acre	57.3%	45	60.7%	33	65.9%	33	2.1%
Afula	62.1%	31	63.4%	21	66.4%	21	3.2%
Arad	69.3%	9	71.3%	8	72.6%	8	2.8%
Ariel	82.8%	1	86.7%	1	90.0%	1	7.4%
Ashdod	67.5%	14	66.9%	15	67.4%	15	2.8%
Ashkelon	68.7%	10	69.3%	11	70.5%	11	3.5%
Bat Yam	67.1%	15	68.4%	13	68.6%	13	2.9%
Beer Sheva	69.6%	8	69.1%	12	70.7%	12	4.3%
Beit Shean	46.0%	70	46.2%	67	51.4%	67	2.4%
Beit Shemesh	57.0%	47	57.5%	43	60.0%	43	3.4%
Carmiel	75.0%	4	74.1%	6	73.5%	6	3.2%
Dimona	56.5%	51	55.9%	48	59.5%	48	3.2%
Eilat	62.7%	30	64.8%	18	68.9%	18	4.0%
Gan Yavne	54.4%	59	50.3%	61	51.5%	61	3.7%
Ganei Tikva	49.5%	66	45.7%	69	45.3%	69	2.1%
Gedera	52.5%	62	47.4%	65	47.3%	65	3.1%
Givat Shmuel	63.5%	29	60.0%	37	59.6%	37	3.8%
Givatayim	63.9%	28	60.7%	31	61.2%	31	2.1%
Hadera	66.3%	18	64.9%	17	66.0%	17	3.0%
Haifa	80.5%	2	80.0%	2	82.4%	2	2.3%
Herzliya	61.5%	32	57.5%	42	57.4%	42	2.1%
Hod Hasharon	54.7%	58	51.2%	60	51.0%	60	1.9%
Holon	61.2%	33	56.9%	44	57.5%	44	2.7%
Jerusalem	56.1%	54	56.0%	47	60.1%	47	2.7%
Kadima-Zoran	56.1%	53	52.1%	59	52.2%	59	2.1%
Kfar Saba	58.4%	43	53.8%	55	53.0%	55	2.2%
Kfar Yona	59.4%	38	53.7%	56	53.8%	56	3.1%

Name of locality	EW		RS		ROS		Voting percentage for "z"
	Nominal score	Rank	Nominal score	Rank	Nominal score	Rank	
Kiryat Ata	59.8%	37	58.1%	40	60.4%	40	2.9%
Kiryat Bialik	65.5%	22	61.8%	26	62.0%	26	2.8%
Kiryat Gat	60.7%	35	63.9%	19	67.6%	19	3.4%
Kiryat Malachi	53.3%	60	58.3%	39	64.4%	39	3.6%
Kiryat Motzkin	67.5%	13	62.9%	22	62.7%	22	2.9%
Kiryat Ono	49.2%	67	46.2%	68	45.9%	68	1.8%
Kiryat Shmona	56.9%	48	58.4%	38	62.9%	38	3.3%
Kiryat Tiv'on	55.4%	55	50.1%	63	49.4%	63	1.9%
Kiryat Yam	68.6%	11	69.7%	10	70.0%	10	3.1%
Lod	58.9%	40	60.8%	30	64.0%	30	3.1%
Ma'ale Adumim	64.8%	27	61.4%	28	63.1%	28	5.0%
Maalot-Tarshiha	70.8%	7	72.5%	7	74.5%	7	3.5%
Mevaseret Zion	59.4%	39	56.8%	45	58.6%	45	2.2%
Migdal Haemek	61.0%	34	62.1%	25	64.2%	25	3.0%
Modi'in Maccabim-Reut	58.2%	44	57.8%	41	58.3%	41	2.8%
Nahariya	65.4%	25	60.6%	34	60.5%	34	3.1%
Nazareth Illit	74.9%	5	78.2%	3	79.7%	3	3.8%
Nesher	79.1%	3	76.0%	4	75.6%	4	3.3%
Ness Ziona	47.7%	69	44.1%	70	44.5%	70	2.4%
Netanya	68.6%	12	66.5%	16	66.4%	16	3.0%
Netivot	51.1%	63	53.3%	57	58.2%	57	2.5%
Ofakim	56.8%	49	61.4%	29	66.7%	29	3.2%

Name of locality	EW		RS		ROS		Voting percentage for "z"
	Nominal score	Rank	Nominal score	Rank	Nominal score	Rank	
Or Akiva	64.9%	26	67.2%	14	69.3%	14	3.5%
Or Yehuda	56.3%	52	55.7%	49	59.1%	49	2.3%
Pardes Hana	60.0%	36	53.9%	54	53.7%	54	2.8%
Petah Tikva	65.5%	23	60.3%	36	59.7%	36	2.9%
Raanana	67.0%	16	63.9%	20	62.4%	20	2.4%
Ramat Gan	65.4%	24	61.8%	27	62.7%	27	2.7%
Ramat Hasharon	50.4%	65	46.7%	66	45.8%	66	1.2%
Ramla	57.1%	46	60.4%	35	65.5%	35	2.6%
Rehovot	65.5%	21	60.7%	32	60.5%	32	3.1%
Rishon Le'zion	65.8%	19	62.5%	24	63.4%	24	2.8%
Rosh HaAyin	58.8%	41	55.0%	50	57.7%	50	3.2%
Sderot	65.6%	20	70.6%	9	75.7%	9	4.4%
Shoham	55.1%	57	54.4%	52	55.2%	52	3.0%
Tel Aviv Jaffa	74.6%	6	75.1%	5	78.8%	5	2.0%
Tiberias	48.4%	68	50.1%	62	54.4%	62	2.5%
Tirat Carmel	55.1%	56	56.1%	46	60.1%	46	3.1%
Yavne	58.4%	42	54.6%	51	57.2%	51	3.0%
Yehud	52.8%	61	48.0%	64	49.2%	64	2.3%
Yokneam Illith	66.5%	17	62.7%	23	61.8%	23	3.6%
Zefat	50.8%	64	53.0%	58	57.2%	58	3.3%
Zichron Yaakov	56.5%	50	54.3%	53	53.9%	53	2.1%

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